



United States of America

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October 2001

United States of America

The United States of America is the world's largest energy producer, consumer, and net importer. It also ranks twelfth worldwide in reserves of oil, sixth in natural gas, and first in coal.

Information contained in this report is the best available as of October 2001 and is subject to change. For the latest monthly U.S. outlook by the Energy Information Administration, please see the ["Short-Term Energy Outlook"](#).



GENERAL BACKGROUND

As of mid-

October 2001, the U.S. economy had slowed considerably, following several years of strong growth, low inflation, low unemployment, and rapid productivity growth. Real (inflation adjusted) U.S. gross domestic product (GDP) growth for 2001 now is expected at 1.0%, down from 4.1% in 2000, and the lowest rate of U.S. economic growth since the last recession (1991). The September 11, 2001 terrorist attack on the United States appears to have exacerbated this slowdown. In response, the US Federal Reserve has cut interest rates sharply over the past several months.

For FY 2000, the federal budget ran a surplus of around \$237 billion, higher than previously forecast.

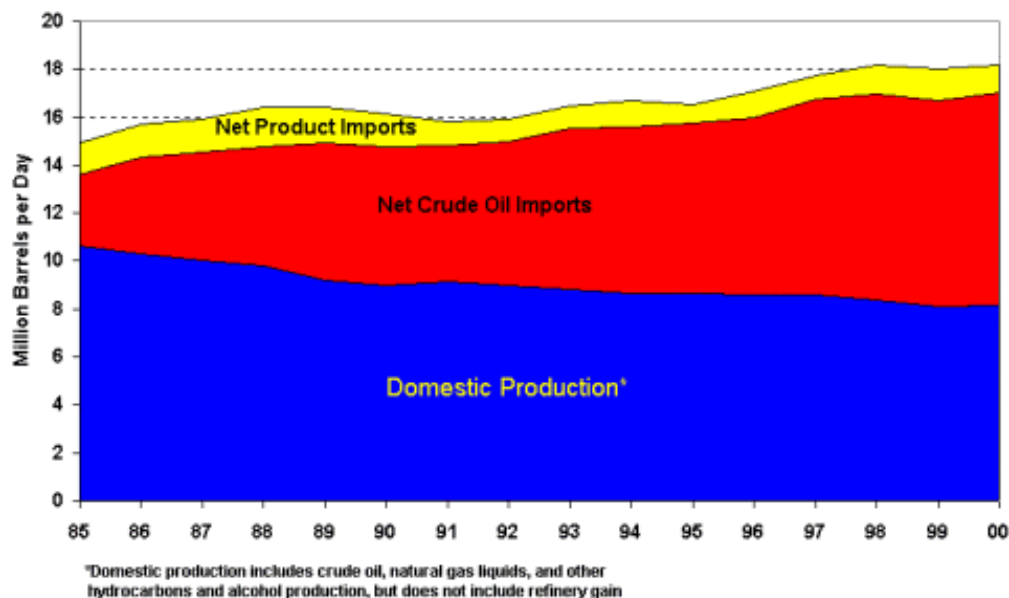
For 2001, the Congressional Budget Office (CBO) as late as spring was projecting a possibly even higher surplus for FY 2001. However, a combination of factors (economic slowdown, tax rebates) reduced this projected surplus significantly, with a deficit now considered possible in FY 2002. Meanwhile, the U.S. merchandise trade deficit surged to \$401.5 billion in 2000. This deficit mainly reflected the strength of the U.S. economy (and a strong dollar) relative to major U.S. trading partners, and is likely to decline somewhat in 2001. Increased oil prices during 2000 also contributed somewhat to the trade deficit (lower prices during September and October 2001 will help put downward pressure on the trade deficit). The current account deficit now is running at over 4% of GDP, compared to 1.7% in 1997.

January 20, 2001, George W. Bush was inaugurated as President of the United States, succeeding Bill Clinton. In mid-May 2001, the Bush administration issued a series of energy policy recommendations as part of its new [National Energy Policy Report](#), developed by a task force led by Vice President Dick Cheney. In August, the U.S. House of Representatives passed an energy bill (the "Securing America's Future Energy" -- SAFE -- Act of 2001) which contained many of the energy plan's recommendations.

OIL

The United States had 21.8 billion barrels of proved oil reserves as of January 1, 2001, twelfth highest in the world. These reserves are concentrated overwhelmingly (over 80%) in four states -- Texas (25% including the state's reserves in the Gulf of Mexico), Alaska (24%), California (21%), and Louisiana (14% including the state's reserves in the Gulf of Mexico). U.S. proven oil reserves have declined by around 20% since 1990, with the largest single-year decline (1.6 billion barrels) occurring in 1991.

U.S. Oil Production and Imports



During 2000, the United States produced around 8.1 million barrels per day (MMBD) of oil, of which 5.83 MMBD was crude oil, and the rest natural gas liquids and other liquids. U.S. total oil production in 2000 was down sharply (around 2.5 MMBD, or 24%) from the 10.6 MMBD averaged in 1985. U.S. crude oil production, which declined following the oil price collapse of late 1985/early 1986, leveled off in the mid-1990s, and began falling again following the sharp decline in oil prices of late 1997/early 1998. With the rebound in world oil prices since March 1999, U.S. crude production basically leveled off once again in 2000. World oil prices rose initially following the September 11 terrorist attacks, but then fell sharply as OPEC reassured world markets that it would maintain plentiful supplies. This left oil markets to focus on world oil demand, which was weakening due to economic slowdown even prior to the terrorist attacks. U.S. crude production for the first 8 months of

2001, if it continues at this rate for the year as a whole, would represent the lowest U.S. crude oil output since 1950. In 2000, there were around 534,000 producing oil wells in the United States, the vast majority of which are considered "marginal" or "stripper" wells, generally producing only a few barrels per day of oil.

Domestic oil exploration and development spending by U.S. major oil companies also rebounded during 2001 from the deep cuts made during the oil price collapse of 1997/1998. Recent lower oil prices, however, could reverse this trend (see below). Improved technology and new or increased offshore production in the Gulf of Mexico (including at deepwater areas beyond the continental shelf) also could help matters. In 2000, deepwater production in the Gulf of Mexico for the first time surpassed shallow water production. In January 2000, Chevron and Shell -- the largest producer in the Gulf of Mexico -- signed an agreement to share drilling rigs and to drill exploratory wells jointly in the deep-water Gulf of Mexico. In August 2001, a US government lease sale for the western Gulf of Mexico produced bids totaling \$165 million, up about \$12 million from 2000. Winning bidders included Kerr-McGee, Spinnaker Exploration, and Petrobras America, among others. A lease sale for the eastern Gulf of Mexico, which was scaled back due to opposition from Florida, is scheduled for December. Overall, production from deepwater areas of the Gulf of Mexico has been increasing rapidly, with deepwater wells expected to account for 65% of total US Gulf output in 2001. Large fields include ExxonMobil's Hoover-Diana development (scheduled to start up this year), and BP's Atlantis, Crazy Horse (the largest single field ever discovered in the Gulf of Mexico), Crosby, Holstein, King, King's Peak, Mad Dog, Marlin, and Nakika fields. BP has stated that it plans to accelerate its deepwater Gulf of Mexico production plans, possibly including construction of a \$1-billion deep-sea pipeline, and to increase its production from 200,000 bbl/d currently to 750,000 bbl/d in 2007. This will require billions of dollars worth of investment.

Crude oil production in the lower 48 states is expected to remain essentially flat through 2002, as is Alaskan crude production, which accounts for around 17% of the U.S. total. Alaskan production is down about 50% from the 2.0 MMBD reached during the peak year of 1988. Most of Alaska's oil output comes from the giant Prudhoe Bay Field, and is transported via the Alyeska pipeline. A new oilfield, known as Alpine (owned 78% by Phillips Petroleum, 22% by Anadarko), began production in November 2000. Alpine represents the largest North American onshore oil discovery in a decade, and was producing 80,000 bbl/d of high quality, light crude oil by the end of 2000. Production at Alpine could rise to 120,000 bbl/d with tie-ins to the Nanuk and Fiord satellite fields. Phillips has been the largest oil producer in Alaska since acquiring Arco's Alaska fields in early 2000. In November 2000, two oil and natural gas lease sales conducted by the State of Alaska drew bids worth \$11 million for offshore tracts in the Beaufort Sea and onshore in the North Slope. In another piece of news from Alaska, the critical Trans-Alaska Pipeline System (TAPS) shut down in early October after being punctured by a gunshot. The TAPS resumed operations on October 8, 2001.

In early 2000, the Energy Information Administration (EIA), in response to a Congressional request, issued a report on potential oil reserves and production from the Arctic National Wildlife Refuge (ANWR). The report, which cited a 1998 U.S. Geological Survey study of ANWR oil resources, projected that for the mean resource case (10.3 billion barrels technically recoverable), ANWR peak production rates could range from 1.0 to 1.35 MMBD, with initial ANWR production possibly beginning around 2010, and peak production 20-30 years after that.

According to Baker Hughes Inc., which has tallied weekly U.S. drilling activity since 1940, domestic oil and natural gas drilling has rebounded sharply since the low point of 488 reached in late April 1999 following the oil price collapse of late 1997. In mid-October 2001, for instance, the U.S. weekly "rig count" reached the 1,141 mark (933 for natural gas and 208 for oil), down slightly from earlier in the year but still close to the highest number since late 1990. Another interesting characteristic of the U.S. rig count is that natural gas rigs now outnumber oil rigs by more than three-fold. Historically, U.S. drilling activity peaked in 1981, with a total of 43,598 oil wells (and 20,166 natural gas wells) drilled in that year. For 2000, a total of 4,731 oil wells (and 15,206 natural gas wells) were drilled in the United States, up from 4,087 oil wells (and 10,513 natural gas wells) in 1999. Total natural gas

wells drilled in 2000 were the most since 1984, prompted by record-high prices and surging natural gas demand. Current sharply lower oil and natural gas prices appear to be causing energy companies to cut back sharply on their drilling activities and plans. As of early October, for instance, the number of natural gas rigs in the United States had fallen 11% from the peak reached in July. Oil rigs were down around 5% from three months earlier. If this trend continues, it could have negative implications for production in a year or so.

Twenty-six major energy companies reported overall net income (excluding unusual items) of \$13 billion on revenues of \$216.1 billion during the second quarter of 2001 (Q201). This level of net income represented a 10% increase relative to the second quarter of 2000 (Q200) (see EIA's ["Financial News for Major Energy Companies"](#)). The increase in net income was chiefly attributed to worldwide oil and natural gas production, followed by domestic downstream refining/marketing, foreign upstream oil and natural gas, worldwide downstream natural gas, and power operations. Earnings also rose, at least in part, due to mergers and acquisitions, a current trend in the energy industry (see below for more details). Preliminary earnings reports for the third quarter of 2001 (Q301) indicate that lower oil and natural gas prices dragged profits down at several major U.S. energy companies. Besides the major energy companies, independent oil and natural gas producers, oil field companies and refiner/marketers also reported big gains in net income (up 126%) during Q201 compared to Q200.

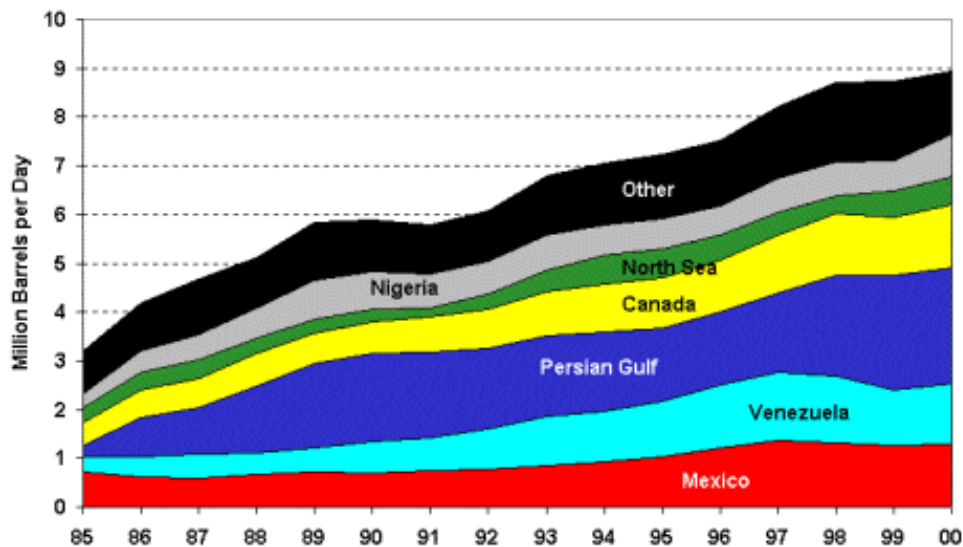
Consumption/Marketing

The United States consumed an average of 19.7 MMBD of oil in 2000. Of this, 8.5 MMBD (or 43% of the total) was motor gasoline, 4.9 MMBD (25%) "other oils," 3.7 MMBD (19%) distillate fuel oil, 1.7 MMBD (9%) jet fuel, and 0.9 million bbl/d (5%) residual fuel oil. U.S. oil demand is expected to remain roughly flat for 2001, and then begin increasing again in 2002. Following the September 11 terrorist attacks, U.S. jet fuel demand fell sharply, and is projected to be down 7% for the second half of 2001 compared to the same period a year ago.

Imports/Exports

Slightly lower U.S. crude oil production in 2000, combined with slightly increased oil demand, led the United States to import (gross) an estimated 11.5 MMBD of oil (crude and products) during 2000, representing around 58% of total U.S. oil demand. Around 45% of this oil came from OPEC nations, with Persian Gulf sources accounting for about 22% of U.S. oil imports during the year. Overall, the top suppliers of oil to the United States during 2000 were Canada (1.81 MMBD), Saudi Arabia (1.57 MMBD), Venezuela (1.55 MMBD), and Mexico (1.37 MMBD).

U.S. Crude Oil Imports by Source



U.S. Energy Sanctions Issues

The United States maintains energy sanctions against several countries, including Iran, Iraq, and Libya (an oil embargo against Serbia was lifted by President Clinton on October 12, 2000). Iraq remains under comprehensive sanctions imposed after its invasion of Kuwait in August 1990. Iran and Libya are affected by the Iran-Libya Sanctions Act (ILSA), passed unanimously by the U.S. Congress and signed into law by President Clinton in August 1996. ILSA imposes mandatory and discretionary sanctions on non-U.S. companies which invest more than \$20 million annually (lowered in August 1997 from \$40 million) in the Iranian oil and natural gas sectors. The passage of ILSA was not the first U.S. sanction against Iran. In early 1995, President Clinton signed two Executive Orders which prohibited U.S. companies and their foreign subsidiaries from conducting business with Iran. The Orders also banned any "contract for the financing of the development of petroleum resources located in Iran." On March 13, 2001, President Bush, citing threats posed by Iran to U.S. national security, extended Clinton's two Executive Orders on Iran for another 6 months. Meanwhile, ILSA is due to expire August 5, 2001, and Congress will need to decide whether or not to renew the sanctions.

As a result of the Executive Orders (but prior to the enactment of ILSA), U.S.-based Conoco was obligated to abrogate a \$550-million contract to develop Iran's offshore Sirri A and E oil and natural gas fields. On August 19, 1997, President Clinton signed Executive Order 13059 reaffirming that virtually all trade and investment activities by U.S. citizens in Iran was prohibited. The threat of secondary U.S. sanctions has also deterred some multinationals from investing in Iran. In August 1996, for instance, Australia's BHP withdrew from a proposed \$3-billion pipeline project to transport Iranian natural gas to Pakistan and India under the threat of U.S. sanctions.

A consortium led by Total (France), Gazprom (Russia), and Petronas (Malaysia) to develop Iran's South Pars natural gas field was granted a waiver under Section 9(c) of ILSA by the United States in May 1998. At the time, U.S. Secretary of State Madeleine K. Albright noted that the United States had concluded that sanctions would not prevent this project from proceeding, and stated that the waiver was also granted because of the cooperation achieved between the United States, the EU, and Russia in accomplishing ILSA's primary objective of inhibiting Iran's ability to develop weapons of mass destruction and support of terrorism.

The United States modified its sanctions on April 28, 1999 to allow shipments of donated clothing, food and medicine for humanitarian reasons (trade in informational materials such as books and movies is also allowed). On the same day that the humanitarian exceptions were made, the U.S. denied Mobil's request to swap crude oil from Kazakhstan with Iran. On March 17, 2000, former

Secretary of State Albright announced that the United States would ease sanctions on Iran, would seek to expand contacts between American and Iranian scholars, professionals, artists, athletes, and nongovernmental organizations, and would increase efforts with Iran aimed at eventually concluding a global settlement of outstanding legal claims between the countries.

Attempts by the United States to implement ILSA have run into opposition from a number of foreign governments. The European Union (EU) opposes the enforcement of ILSA sanctions on its members, and on November 22, 1996 passed resolution 2271 directing EU members to not comply with ILSA. On May 18, 1998, the EU and the U.S. reached an agreement on a package of measures to resolve the ILSA dispute at the EU/U.S. Summit in London, but the Summit deal is contingent upon acceptance by the U.S. Congress before full implementation may take place.

On April 5, 1999, following the Libyan handover of two suspects in the 1988 bombing of Pan Am flight 103 to stand trial before a Scottish Court in the Netherlands, the United States modified its Libya sanctions on April 28, 1999 to allow shipments of donated clothing, food and medicine for humanitarian reasons (trade in informational materials such as books and movies is also allowed). However, all other U.S. sanctions against Libya remain in force. On February 1, 2001, one suspect was convicted by the Scottish court, while another was acquitted. The U.S. and British governments both said that they still expected Libya to accept responsibility for the murders, which Libya has said it would not do.

Refining

The United States has experienced a steep decline in refining capacity since 1981. Between 1981 and 1989, the number of U.S. refineries fell from 324 to 204, representing a loss of 3 MMBD in operable capacity, and a concomitant increase in refining capacity utilization from 69 to 86%. Much of this decline resulted from the 1981 deregulation (elimination of price controls and allocations), which effectively removed the major prop from underneath many marginally profitable, often smaller, refineries. Between 1989 and 1992, refining capacity remained roughly stable. Since 1992, over 30 additional, mainly small U.S. refineries have shut down, for a wide variety of reasons (economic, regulatory, etc.). This, combined with higher refinery runs, raised average weekly capacity utilization to 96% in 1998, before falling off to an average 92.7% in 1999. As of October 2001, capacity utilization at U.S. refineries reportedly was averaging around 92%-94%. Although financial, environmental, and legal considerations make it unlikely that new refineries will be built in the United States, expansion at existing refineries likely will increase total U.S. refining capacity in the long-run. EIA reports that nameplate refining capacity has increased by about 700,000 bbl/d between 1997 and 1999.

Since the mid-1980s, several U.S. refiners have joined with foreign (especially Venezuelan) companies in various joint venture arrangements. In 1986, for instance, Venezuela's state oil company PdVSA acquired a 50% interest in Citgo's U.S. refining operation. In 1988, Texaco and Saudi Aramco created Star Enterprise, an integrated refining and marketing operation with three refineries and a network of Texaco gasoline stations. Unocal and PdVSA followed suit in 1989, forming Uno-Ven Co. (in 1997, PdVSA bought out Unocal's share). In late October 1997, Mobil signed an agreement with a PdVSA subsidiary on joint ownership of the 170,000-bbl/d refinery in Chalmette, Louisiana.

Strategic Petroleum Reserve (SPR)

The SPR was officially established on December 22, 1975, when then-President Ford signed the Energy Policy and Conservation Act (EPCA). EPCA declared it to be U.S. policy to establish a petroleum reserve of up to 1 billion barrels. In order to store the reserve oil, the U.S. government in April 1977 acquired several salt caverns along the Gulf of Mexico coastline. The first crude oil was delivered to the SPR on July 21, 1977, and stored at the West Hackberry storage site near Lake Charles, LA. Other major storage sites include: Bryan Mound and Big Hill in Texas; and Bayou Choctaw, the St. James Terminal in Louisiana, with a total storage capacity of 700 million barrels.

The volume of oil stored in the SPR peaked at 592 million barrels in 1994. After selling off \$327

million worth of SPR oil in 1996, and \$220 million in 1997, the SPR now contains around 545 million barrels of oil -- still the largest emergency oil stockpile in the world. However, in relative terms the SPR has shrunk from about 115 days of import replacement in 1985 to around 51 days now. On October 11, 2001, the US House of Representatives passed a non-binding resolution to fill the SPR.

Under EPCA, there is no preset "trigger" for withdrawing oil from the SPR. Instead, the President determines that drawdown is required by "a severe energy supply interruption or by obligations of the United States" under the International Energy Agency. EPCA defines a "severe energy supply interruption" as one which: 1) "is, or is likely to be, of significant scope and duration, and of an emergency nature;" 2) "may cause major adverse impact on national safety or the national economy" (including an oil price spike); and 3) "results, or is likely to result, from an interruption in the supply of imported petroleum products, or from sabotage or an act of God."

Should the President decide to order an emergency drawdown of the SPR, oil would be distributed mainly by competitive sale to the highest bidder(s). This would be accomplished in a 4-step process, including a "Notice of Sale," receipt of bids, selection of bidders, and finally delivery of oil. Today, the SPR can withdraw oil at a maximum sustained rate of 4.1-4.2 MMBD for a 90-day period (lower after that).

On September 22, 2000, President Clinton authorized the release of 30 million barrels of oil from the SPR over 30 days in an attempt to bolster U.S. oil supplies and to alleviate possible shortages of heating oil during the upcoming winter. The release took the form of a "swap" (bidding results were announced on October 4) in which crude oil volumes drawn from the SPR is to be replaced by the recipients at a later date. Oil prices fell in anticipation of, and in reaction to, the news.

Oil Mergers and Acquisitions

Pushed in part by low oil prices during 1998 and into early 1999, but also by the desire for oil reserves, cost cutting, and higher refining/marketing shares, merger activity in the oil business accelerated sharply over the past 2-3 years. The largest merger/acquisition announcements came from BP and Amoco, Exxon and Mobil, BP Amoco and ARCO, and, most recently, Chevron and Texaco. BP and Amoco completed their \$53-billion merger on December 31, 1998, a day after the deal received regulatory approval from the U.S. Federal Trade Commission (FTC), subject to certain conditions.

On April 13, 2000, the FTC approved the \$27.6-billion BP Amoco-ARCO deal. This followed the March 15, 2000 announcement by Phillips Petroleum that it had agreed to purchase ARCO's assets in Alaska for \$6.5 billion. The sale was made as part of an effort to secure approval from the FTC. On the same day, the FTC announced that it had suspended its antitrust lawsuit seeking to block the merger, citing progress in talks with the companies involved. Among other issues, the FTC was concerned that the BP Amoco-ARCO merger would control about 75% of Alaskan North Slope crude oil output and over 70% of the critically important TAPS line, potentially hurting consumers on the U.S. west coast. BP Amoco agreed to sell some pipeline and oil storage holdings in Cushing, Oklahoma. The new company (now called BP) will rank in the top three private oil companies in the world, along with ExxonMobil and Royal Dutch/Shell.

Meanwhile, the \$81-billion merger between Exxon and Mobil, which formed the world's largest privately owned petroleum company (in terms of revenues), was approved by the FTC on December 1, 1999, subject to the divestiture of 2,400 service stations and other assets (on December 3, 1999, 1,740 of these stations were sold to Tosco, the largest U.S. independent oil refiner). In a related development, in April 2000, Duke Energy said that it had agreed to acquire Mobil's European natural gas trading and marketing business. The sale of Mobil's natural gas operations in Europe was required by the European Commission as part of its approval of the ExxonMobil merger.

On October 16, 2000, another major oil industry merger/acquisition was announced, this time

between Chevron and Texaco. According to the announcement, Chevron is to buy Texaco for \$35 billion in stock, creating the world's fourth largest energy company (behind ExxonMobil, Shell, and BP). The deal received regulatory approval in early October 2001, and was approved by shareholders of the two companies on October 9, creating ChevronTexaco.

On November 3, 2000, Russia's Lukoil announced that it intended to purchase Getty Petroleum Marketing for \$71 million. Lukoil eventually intends to switch Getty's 1,300 retail outlets in the Northeastern and Middle Atlantic states to the Lukoil brand name. The purchase represents the first takeover of a publicly traded U.S. company by a Russian firm. In late January 2001, Getty shareholders approved the the buyout.

Besides these large mergers, several defensive mergers among smaller, independent oil companies also have been unveiled recently, including Kerr-McGee Corp.'s (KMG) \$1.86-billion takeover of Oryx Energy Co. (ORX), and an agreement between Seagull Energy Corp. (SGO) and Ocean Energy Inc. (OEI) to merge in a \$1.1-billion deal. On July 14, 2000, Anadarko Petroleum announced the closing of its merger transaction with the Union Pacific Resources Group. Union Pacific became a wholly owned subsidiary of Anadarko, creating one of the largest U.S. independent oil and natural gas companies. In January 2001, Amerada Hess announced that it was withdrawing a \$3.5-billion offer to purchase Britain's Lasmo P.L.C., a move which would have created a "super-independent" oil company. Instead, Lasmo was purchased by Italy's ENI for \$4 billion.

Due to low profitability in the refining/marketing line of business, U.S. integrated major energy companies began a process during the 1990s of selective refining/marketing divestiture, and numerous U.S. refineries were shut down. Among independent refiners, growth largely has been concentrated in the following group of companies: Citgo/PDV America, Clark Refining and Marketing, Diamond Shamrock (merged with Ultramar during 1996, creating Ultramar Diamond Shamrock), Koch Industries, Tesoro Petroleum, Ultramar, and Valero Energy. In May 2001, Valero agreed to acquire Ultramar Diamond Shamrock for \$6 billion. Another company, Tosco Corporation, was purchased by Phillips Petroleum for \$6.1 billion in February 2001, creating the second largest refining group in the United States, behind ExxonMobil.

NATURAL GAS

As of January 1, 2001, the United States had estimated proven natural gas reserves of 167 trillion cubic feet (Tcf), or 3.2% of world reserves (6th in the world). In 2000, the United States produced 19.1 Tcf of dry natural gas. Also during 2000, the United States consumed 22.7 Tcf and imported (net) around 3.5 Tcf of natural gas, largely from Canada. Overall, the United States depends on natural gas for about 24% of its total primary energy requirements (oil accounts for around 39% and coal for 23%).

Over the past several months, natural gas wellhead prices have fallen sharply, to around \$2.50 per thousand cubic feet (mcf), after reaching record highs of nearly \$10.00 per mcf in late 2000/early 2001. Factors behind the sharp drop in natural gas prices include: a slowing economy (especially weak industrial demand); generally moderate summer weather; and increased supply due in part to high prices.

Natural Gas Production

Domestic natural gas production is projected to increase through 2002 as the effects of sharply increased drilling over the past year begin to be felt. Exploration and production budgets for many natural gas producers increased sharply in 2000, spurred by higher prices and greatly improved current and expected revenues.

U.S. natural gas production (and net imports, mainly from Canada) is likely to increase sharply over the next two decades in response to strong demand, abundant reserves, and improved unconventional and offshore recovery technology. Increased natural gas production is expected to come mainly from onshore sources, although offshore Gulf of Mexico production also is forecast to grow significantly.

In August 2001, for instance, ExxonMobil began production at its \$330 million Mica natural gas project in the deepwater Gulf of Mexico. Alaska's North Slope fields also represent a large potential natural gas source, with an estimated 30-35 Tcf of natural gas reserves. Alaska's Governor Tony Knowles has stated that he supports a \$17.2 billion natural gas pipeline running from the North Slope along the Alaska Highway into Alberta and on to markets in the U.S. Midwest (another option would be to route the pipeline via the MacKenzie Delta in northern Canada). Increased natural gas production likely will come mainly from lower 48 sources, with increased use of cost-saving technologies expected to result in continuing large natural gas finds, including in the deep waters of the Gulf of Mexico but also in conventional onshore fields. Currently, top natural-gas-producing states (in descending order) include Texas, Louisiana, Oklahoma, New Mexico, Wyoming, Colorado, Kansas, Alaska, California, and Alabama.

Natural Gas Demand

From 1990 through 2000, natural gas consumption in the United States increased by about 22%, and this growth is likely to continue in the future. Greater use of natural gas as an industrial and electricity generating fuel can be attributed, in part, to its relatively clean-burning qualities in comparison with other fossil fuels. Lower costs resulting from greater competition and deregulation in the natural gas industry and an expanding transmission and distribution network have also helped expand its acceptance and use. In 2000, natural gas consumption increased by over 1 Tcf, after a 0.4 Tcf increase in 1999. During 2000, natural gas consumption by electric utilities fell slightly, to 3,043 billion cubic feet (Bcf), down 70 Bcf from 1999, while natural gas consumption by nonutility generators increased. Natural gas is consumed in the United States mainly in the industrial (41%), residential (22%), commercial (15%), and electric utility (13%) sectors (note: EIA generally places consumption of natural gas for power generation by nonutilities, including natural gas used for industrial cogeneration, in the "industrial" category). For the first eight months of 2001, natural gas demand is down slightly from the same period the previous year.

U.S. natural gas consumption and imports, largely from Canada (and to a far lesser extent from liquefied natural gas -- LNG, with Mexico a small net importer of natural gas from the United States), are expected to expand substantially in coming decades, with the fastest volumetric growth resulting from additional natural-gas-fired electric power plants. In particular, new combined-cycle facilities furnished with more efficient natural gas turbines will help lower the cost of natural-gas-generated electricity to levels competitive with coal-fired plants. Increased U.S. natural gas consumption will require significant investments in new pipelines and other natural gas infrastructure -- \$1.5 trillion over the next 15 years according to the National Petroleum Council. The largest natural gas pipeline project currently under construction is the \$1.2 billion Gulf Stream pipeline, which will run 564 miles from Alabama to Florida. Mexico could potentially become a significant natural gas exporter to the United States in the long term. One U.S.-Mexican natural gas pipeline proposal currently on the table is the \$230-million, 212-mile North Baja line connecting southeastern California and Tijuana, Mexico. Companies involved in this project include Sempra Energy, PG&E, and Mexico's Proxima Gas. The project is slated to come online in January 2003, but is currently awaiting approval by the U.S. Federal Energy Regulatory Commission (FERC).

Domestic and Import Pipelines

On November 1, 1993, FERC issued Order No. 636, which decoupled the various stages of the natural gas industry between wellhead and end-user. This order has led to significant restructuring of the interstate natural gas pipeline industry, including moves towards unbundled services, diversification into other energy sectors, and development of mega-pipeline systems.

During the past decade, interstate natural gas pipeline capacity has increased substantially. From January 1996 through August 1998 alone, at least 78 projects were completed adding approximately 11.7 billion cubic feet per day of capacity, and much more will be needed in coming years. Recently completed pipelines include the Pony Express project and the Trailblazer system expansion, providing access from the Wyoming and Montana production regions. Also, the Transwestern and El Paso natural gas pipeline expansions have increased capacity from New Mexico's San Juan Basin.

On December 1, 2000, the \$2.9-billion, 1.3-Bcf/day Alliance Pipeline from western Canada (Fort St. John, British Columbia) to the Chicago area entered service. Another pipeline, the Independence Pipeline (\$678 million), has been delayed until November 2002, but received FERC approval in July 2000. Columbia Gas System's Millennium project (\$700 million), which would connect Canadian natural gas sources to New York and Pennsylvania, remains in the regulatory approval process. In February 2000, FERC issued Order 637, the goal of which is to build on Order 636 and to further deregulate the U.S. natural gas industry. The order calls for price liberalization for short-term resale of pipeline capacity and allowance of seasonal rate differentials.

Growing U.S. demand for Canadian natural gas has been a dominant factor underlying many of the pipeline expansion projects this decade. The U.S. and Canadian natural gas grids are highly interconnected and Canadian natural gas has become an increasingly important component of the total natural gas supply for the United States. This is especially true for certain U.S. regions such as the Northeast, Midwest, and Pacific, which depend on Canadian natural gas for significant amounts of their supply. Overall, the United States received about 3.5 Tcf of natural gas (net) from Canada in 2000. Mexico is a small net importer of natural gas from the United States.

The most significant recent expansion of natural gas pipeline capacity from western Canada to the United States is the Northern Border system through Montana into the Midwest. Expansion of the TransCanada pipeline will add another 164 Bcf to these imports, while the new Alliance pipeline from western Canada to Chicago will add as much as 730 Bcf (although not immediately; for a while there will be spare pipeline capacity as production capacity ramps up). This trend is expected to continue as Canadian production expands rapidly in the western provinces of British Columbia and Alberta and is developed off the east coast of Nova Scotia. Consequently, more pipeline projects are expected to be built to gain greater access to these Canadian supplies, including proposed expansion of the NOVA system in Alberta, Canada, by up to 2.3 Bcf per day. This in turn will link with the TransCanada Pipeline system expansion and its connections with existing and new U.S. pipelines feeding into the expanding markets in the Midwest and Northeast. In addition, the Maritimes & Northeast Pipeline running from Sable Island to New England, began operations in early 2000.

On October 12, 2001, the U.S. Coast Guard lifted the ban on liquefied natural gas (LNG) tankers from Boston harbor. The ban, in effect since September 26 (two weeks after the terrorist attacks in New York and Washington, DC), was established in response to security and safety concerns about the ships that bring LNG to the import facility of Distrigas of Massachusetts (a Division of Tractebel, Inc.). The decision enables the reopening of the Distrigas facility in Everett, Massachusetts, which received 45 shipments containing 99 Bcf of natural gas in 2000, mostly from Trinidad, accounting for 44% of total LNG imports into the United States that year. LNG is an integral part of natural gas supplies for New England. This is particularly true during the winter season, when LNG represents around 30% of local distribution company (LDC) deliveries to consumers. The Distrigas facility is one of three currently active LNG facilities in the United States. The other two active facilities are located in Lake Charles, Louisiana, and the recently reopened facility in Elba Island, Georgia. An additional LNG facility, in Cove Point, Maryland, is scheduled to reopen in 2002. There is growing interest in LNG to supply natural gas for electric power generation and provide supply flexibility. EIA expects that LNG imports to the United States will increase at an average 8% annual rate to 810 Bcf by 2020.

Natural Gas Mergers and Acquisitions

As with oil, a number of major natural gas market participants are engaging in various forms of corporate combinations, such as mergers, acquisitions, and strategic alliances. The value of mergers and acquisitions within the natural gas industry quadrupled from \$10.4 billion in 1990 to \$39 billion in 1997. This increase parallels an enormous surge in corporate combinations (mergers, acquisitions, joint ventures and strategic alliances) across the energy sector. In August 2001, Devon Energy announced the acquisition of Mitchell Energy for \$3.1 billion, forming the second largest independent natural gas producing company in the United States, behind Anadarko Petroleum Corp. In late

January 2001, El Paso Energy completed its \$24-billion merger with Coastal, creating the fourth-largest U.S. energy company by market capitalization (after BP, Texaco-Chevron, and Enron). The October 1999 merger between El Paso Energy Corporation and Sonat had created the largest transporter of natural gas in the country.

COAL

The United States produced 1,076 million short tons (Mmst) of coal in 2000, consumed 1,082 Mmst and exported (net) 46 Mmst. Also, there was a stock "draw" in 2000 of more than 40 Mmst from 1999 stock levels. Wyoming is by far the leading U.S. coal-producing state (with over 30% of the U.S. total), followed by West Virginia and Kentucky. Appalachia accounts for nearly two-fifths of total U.S. production, mainly from underground mines. Nearly all remaining U.S. coal production came from states west of the Mississippi River, overwhelmingly from surface mines. For the country as a whole in 1998, 57% of coal produced was bituminous, 35% subbituminous, and 8% lignite (brown coal). Around 80,000 miners work in the \$20 billion U.S. coal industry, down from a peak of 700,000 in 1923, when U.S. coal production was half what it is today. Major U.S. coal companies include Peabody Energy (the largest in terms of production), Kennecott Energy, and Arch Coal.

During 2000, coal production increased slightly in the West, but fell sharply in the interior United States, and was slightly down in Appalachia. Low-sulfur western coal production surpassed relatively higher-cost, higher-sulfur, Appalachian coal for the first time in 1998, following strong increases since 1994, prompted largely by Phase 1 of the Clean Air Act Amendments of 1990 (CAAA). CAAA originally took effect during 1995, and required lower sulfur emissions from coal combustion. In response, Wyoming increased its coal production sharply, particularly low-sulfur, low-ash (and low cost) coal from the Powder River Basin, where coal is strip-mined. Output growth from Appalachia in 1996 was largely a result of strong demand by eastern electric utilities, a decline in nuclear and natural-gas-fired generation in the East, and a rise in exports. A proposal to ship Western coal to power plants in the eastern and midwestern United States via a new, \$1.4 billion rail line currently is under consideration by Federal regulators.

Electric utilities account for the vast majority (around 90%) of U.S. coal consumption, with independent power producers (IPPs) and manufacturing taking nearly all the rest. This pattern is expected to continue through 2020 at least, with coal maintaining a fuel cost advantage over oil and natural gas, and coal demand reaching 1,297 Mmst. As sulfur dioxide emissions standards are tightened (in 2000, for instance, Phase 2 of CAAA took effect), the share of low-sulfur coal in the U.S. coal consumption mix is expected to increase. In 1999, low and medium-sulfur coals had approximately the same share of the U.S. coal market, with high-sulfur coal far behind.

The United States is the fourth largest coal exporter in the world, behind Australia, South Africa, and Indonesia. U.S. coal exports have fallen precipitously since 1995 due mainly to lower world coal prices and increased competition from other coal-producing nations (i.e., Australia, South Africa, Indonesia, Venezuela, Colombia), plus natural gas -- especially in Europe. Both steam coal and metallurgical coal exports declined sharply in 1999, by 15% and 32%, respectively. Export markets for metallurgical coal have been declining over the past few years because of the expansion of new steel-making technologies requiring less high-grade coking coal. Consequently many U.S. metallurgical coal operations have closed, and increased amounts of metallurgical coal have been sold into the domestic utility steam coal market. The U.S. coal industry is expected to continue to face strong competition from other coal-exporting countries, with limited or negative growth in import demand in Europe and the Americas. Given this, it is likely that the U.S. share of world coal exports will decline in coming years.

ELECTRICITY

In 2000, the United States generated 3,800 billion kilowatthours (Kwh) of electricity, including 3,015 billion Kwh at electric utilities plus an additional 785 billion Kwh at nonutility producers. For utilities, coal-fired plants accounted for 56% of generation, nuclear 23%, natural gas 10%, hydroelectricity 8%, oil 2%, geothermal and "other" 0.1%. For non-utilities, natural gas plants

accounted for around 39% of generation, followed by coal at 35%, "geothermal and other" (including geothermal, wind, solar, wood and waste) at about 10%, nuclear at 6%, oil at 5%, hydroelectric at 3%, and "other gaseous fuels" (including refinery still gas and liquefied petroleum gases) at 1%. Volatile natural gas prices also have increased interest in possible new coal-fired power plants, with several companies (the Peabody Group, Wisconsin Energy, Tucson Electric) announcing plans in this area. Coal-fired power plants generally have been less attractive than natural-gas-fired plants in recent years due to relatively high capital costs, longer construction periods, and lower efficiency than natural gas combined-cycle plants.

On a national level, the price of electricity sold by utilities during the first half of 2001 averaged 7.00 cents per Kwh, up from 6.47 cents per Kwh during the first half of 2000, with higher natural gas input prices largely responsible. Electricity prices in the United States fell every year between 1993 and 1999, but this trend reversed in 2000 and the first half of 2001.

As of January 1, 1999, U.S. generating capacity at electric utilities was 687 gigawatts (GW). Based on primary energy source, coal-fired capacity represented 40% of the nation's existing electric generating capacity in 1998. Natural-gas-fired capacity accounted for 21%; nuclear for 13%; hydroelectricity for 13%; petroleum for 9.3%; and "renewables" for 2.8%. The amount and geographical distribution of capacity by energy source is a function of availability and price of fuels and/or regulations. Capacity by energy source generally shows a geographical pattern such as: significant petroleum-fired capacity in the East, hydroelectric in the West, and natural-gas-fired capacity in the Coastal South.

U.S. power demand is increasing rapidly, with EIA forecasting 1.8% average annual growth in electricity sales through 2020. This increase will require a significant addition in generating capacity, with EIA forecasting that 1,300 new power plants will be needed over the next 20 years. Whether these plants are natural-gas-fired, coal-fired, "renewable," or nuclear depends on a mix of factors, including economics and government policy, but if recent trends continue, it is likely that the vast majority of new plants will be natural-gas-fired, with oil accounting for less than 1% of power generation by 2020.

The changing structure of the U.S. electric power industry has resulted in many electric utilities restructuring their companies and selling their generating assets, primarily to nonutility companies. During 1999, approximately 55,070 MW of capacity was sold to nonutility companies. On March 31, 1998, retail customers of investor-owned utilities in California (approximately three-fourths of the state's customers) were allowed direct access to an alternative energy (electricity) service provider. Also during 1998, Massachusetts and Rhode Island opened their retail electricity markets. Meanwhile, legislatures and/or public utility commissions in 18 other states (plus the District of Columbia) also have approved or implemented plans to move toward retail competition (although California's problems have caused many of these states to take a second look. On April 2, 2001, Entergy and the FPL Group called off a proposed \$7.6-billion merger which would have created the largest power distribution company in the United States. This follows the collapse in 2000 of a proposed \$3.3-billion merger between Connecticut's Northeast Utilities and New York's Consolidated Edison Co.

During much of 2000 and early 2001, California confronted a major power problem, with intermittent "rolling blackouts" and "Stage 3" (the highest level) alerts. Causes of this situation included: 1) sharply increased (11%) power demand in California over the past decade as a result of a surging economy and low power costs to consumers; 2) stagnant supply over the same period; 3) low hydropower output levels in the Northwest due to below-normal rainfall; 4) California's heavy reliance on out-of-state capacity and power imports; 5) high natural gas prices and lingering problems from the August 2000 El Paso natural gas pipeline explosion; 6) significant problems stemming from California's Electric Utility Industry Restructuring Act of 1996; and 7) serious financial problems at utilities (PG&E, SCE). Serious problems, however, were largely avoided during the summer of 2001 due to conservation, a downturn in California's economy (and hence power demand), the addition of power generating capacity, and higher power prices. On September 24, 2001, as required by law, the CPUC effectively put an end to deregulation of retail electricity in California. Although California for

the most part avoided power blackouts or other major problems this past summer, financial difficulties continue at utilities like Pacific Gas & Electric (PG&E, in bankruptcy) and Southern California Edison (close to bankruptcy). On October 22, 2001, the US Department of Energy, in partnership with PG&E, announced that it would spend \$300 million to upgrade Path 15, a series of power transmission lines connecting northern and southern California.

In March 2001, the Energy Secretaries of Canada, Mexico, and the United States met to discuss a common energy strategy for the three countries, including integration of the three countries' power grids and creation of a US-Mexican working group to focus on promoting cross-border electricity trade. At present, power trade between Mexico and the United States is severely limited by infrastructure constraints, including inadequate power transmission capability (there are only two cross-border transmission lines: San Diego-Tijuana and El Paso-Matamoros). In January 2001, a small (50-MW), natural-gas-fired power plant in Baja California began exporting power to California. Canada exported about 42.9 bkwh of electricity to the United States in 1999, mostly from Quebec, Ontario, and New Brunswick to New England and New York. Smaller volumes are exported from British Columbia and Manitoba to Washington state, Minnesota, California, and Oregon. There is considerable reciprocity between the Canadian and U.S. power markets, as the United States also exports smaller volumes of electricity to Canada.

Nuclear

In 2000, nuclear power generation reached a record 753 billion kWh, or about 20% of total U.S. electricity generation, second only to coal in the U.S. electricity generation mix. Nuclear power's share of U.S. utility electric generating capacity in 2000 was highest in the New England region (73% of utility generation), followed by the Middle Atlantic (55%), the South Atlantic (28%), the East North Central (25%), the East South Central (21%), the Pacific (19%), the West North Central (17%), the West South Central (15%), and the Mountain region (10%). The average capacity factor for all nuclear units increased from 85.3% in 1999 to 88.1% in 2000, and many individual units achieved a 90% or higher utilization rate.

Nuclear power in the United States grew rapidly after 1973, when only 83 billion kWh of nuclear power was produced. As of 2000, nuclear power had grown 9-fold, with 104 nuclear power units generating 754 billion kWh of electricity. This rapid growth in nuclear power generation, however, obscures serious underlying problems in the U.S. nuclear industry. After 1974, many planned units were canceled, and since 1977, there have been no orders for any new nuclear units, and none are currently planned. The 1979 Three Mile Island accident greatly increased concerns about the safety of nuclear power plants in the United States. The regulatory reaction to those concerns contributed to the decline in the number of planned nuclear units. In late March 2000, the Nuclear Regulatory Commission (NRC), in a positive signal to the U.S. nuclear power industry, granted the first-ever renewal of a nuclear power plant's operating license. The 20-year extension (until 2034 and 2036 for two reactors) went to the 1,700-MW Calvert Cliffs plant in Maryland. Following the September 11, 2001 terrorist attacks on the United States, security at nuclear power plants around the United States was increased dramatically.

A 1982 law required the DOE to dispose of spent fuel as of January 31, 1998; however, feasibility studies have yet to be completed for an underground site in Nevada's Yucca Mountain, located 100 miles north of Las Vegas. DOE had argued that the 1998 deadline was contingent upon completion of an acceptable storage facility. Meanwhile, Congress in February and March passed legislation which would establish an interim waste storage facility (by 2007) at Yucca Mountain pending agreement on a permanent repository. On April 25, President Clinton vetoed the bill. Yucca Mountain is not expected to be ready to accept nuclear waste shipments before 2010 (and possibly 2020), 12-22 years behind the schedule set by Congress. Meanwhile, nuclear utilities are complaining that they are running out of nuclear waste storage capacity at their nuclear plants, with many being forced to resort to "dry cask" storage of spent fuel assemblies after water-storage pools reached capacity. Former Secretary of Energy Bill Richardson estimated that DOE's liability in failing to meet the 1998 deadline for taking nuclear waste from utilities was around \$500 million-\$1.5 billion. The Nuclear

Energy Institute has estimated DOE's long-term, industry-wide liability at greater than \$50 billion.

Hydroelectricity/Other "Renewables"

The United States consumed 6.9 quadrillion Btu of renewable energy in 2000, about 7% of total domestic gross energy demand, with the largest component used for electricity production. Hydropower makes up around 46% of total U.S. renewable consumption, with biofuels (including wood and waste), solar, wind, and geothermal making up most of the remainder.

ENVIRONMENT

The United States, with the world's largest economy, is also the world's largest single source of anthropogenic (human-caused) greenhouse gas emissions. Quantitatively, the most important anthropogenic greenhouse gas emission is carbon dioxide, which is released into the atmosphere when fossil fuels (i.e., oil, coal, natural gas) are burned. Current projections indicate that U.S. emissions of carbon (mainly in the form of carbon dioxide) will reach 1,690 million metric tons in 2005, an increase of 353 million metric tons from the 1,337 million metric tons emitted in 1990, and around one-fourth of total world energy-related carbon emissions. At the December 1997 global warming summit in Kyoto, Japan, the U.S. delegation agreed to reduce U.S. carbon emissions 7% from 1990 levels by 2008-2012. Given current EIA projections, it is unlikely that this goal will be met.

U.S. energy-related carbon emissions have been increasing for three main reasons. First, the U.S. economy experienced strong economic growth during the 1990s, which in combination with generally low oil prices for most of the period (until recently), caused energy consumption to increase. Second, the energy "efficiency gains" of the 1980s, which were prompted largely by the oil price spikes of the 1970s, have been leveling off for several years now, particularly since the 1985/86 oil price collapse. Sales of sport-utility vehicles, minivans, and small trucks, for instance, all of which are less fuel efficient than small cars, have increased sharply in recent years. Third, nuclear power generation (which emits no carbon), has now stagnated and is expected to decline after expanding rapidly during the 1970s and 1980s. Hydroelectricity, the other major non-fossil energy source in the United States, also has not been growing.

Meanwhile, other non-carbon emitting renewables such as wind, solar, biomass, and geothermal power, although growing, still supply only a tiny fraction of U.S. energy needs. In January 2000, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) released a report which said that photovoltaic (PV) cells could provide 15% of U.S. power by 2020. Wind, geothermal, and biomass energy sources also have significant potential in the United States. In 2000, 53 MW of wind power was installed in the United States, down sharply from the record 730 MW installed in 1999, according to the American Wind Energy Association (AWEA).

Since taking office on January 20, 2001, the Bush Administration has taken a series of actions related to energy and the environment. On February 28, 2001, EPA Administrator Christine Todd Whitman directed her agency to move ahead with a rule issued by President Clinton that will require U.S. refiners to reduce sulfur in diesel fuel from 500 parts per million currently, to 15 parts per million by 2006. On March 13, 2001, President Bush declared that his administration would not seek to regulate power plants' emissions of carbon dioxide, citing an EIA study that regulating these emissions could result in higher electricity prices. On March 27, the Bush administration declared that the United States had "no interest" in implementing or ratifying the Kyoto treaty, saying it would be too harmful to the U.S. economy, and that it would pursue other ways of addressing the climate change issue. On April 10, the EPA asked the U.S. Court of Appeals in Washington, DC to uphold a Clinton administration plan to regulate mercury pollution from coal-fired power plants, beginning in 2004. On April 12, the White House affirmed Clinton administration-approved energy efficiency standards for washing machines and water heaters. Under these standards, clothes washers would become 22% more efficient by 2004 and 35% more by 2007. The next day (April 13), the Department of Energy announced that it would require air conditioners to be 20% more energy efficient by 2006. The Clinton administration had mandated a 30% energy efficiency increase for air conditioners. Finally, on April 17, the EPA announced that it would proceed with the "Toxic Release Inventory" (TRI) rule,

adopted in the closing days of the Clinton administration, which will lower the the reporting thresholds for lead and lead compounds by manufacturing and processing plants from 10,000 pounds per year to 100 pounds per year.

COUNTRY OVERVIEW

President: George W. Bush (since January 20, 2001)

Legislative Branch: Bicameral Congress (Senate, House of Representatives)

Judicial Branch: Supreme Court

Independence: July 4, 1776

Population (July 2001E): 278 million

Location/Size: North America, between Canada and Mexico/9,629,091 sq. km (3,717,792 sq. miles), the third largest country in the world, behind Russia and Canada

Major Cities: Washington, DC (capital), New York, Los Angeles, Chicago, Houston, Miami, Philadelphia, etc.

Languages: English, Spanish (spoken by a sizable minority)

Ethnic Groups (8/1/2000): White (82.2%), Black (12.8%), Asian (4.1%), Native American (0.9%).

Note: Hispanics, who can be of any race, made up 11.8% of the U.S. population as of 8/1/2000.

Religions (1997): Protestant (58%), Roman Catholic (26%), Jewish (2%), other (6%), none (8%)

Defense (8/98): Army, 479,400; Navy, 380,600; Air Force, 370,300; Marine Corps, 171,300 (the United States also has nearly 1.35 million reservists)

ECONOMIC OVERVIEW

Currency: Dollar (\$)

Exchange Rates, per Dollar (10/25/2001): British Pound (0.6992); Canadian Dollar (1.58); Euro (1.1259); French Franc (7.3201), German Mark (2.1825); Japanese Yen (122.68)

Gross Domestic Product (GDP) (2001E): \$10.3 trillion

Real GDP Growth Rate: (2000E): 4.1% **(2001E):** 1.0% **(2002F):** 2.2%

Inflation Rate (GDP implicit price deflator) (2000E): 2.3% **(2001E):** 2.2% **(2002F):** 1.9%

Unemployment Rate (2000E): 4.2% **(2001E):** 4.8%

Current Account Balance (2000E): -\$435.4 billion **(2001E):** -\$453 billion

Merchandise Exports (2000E): \$773 billion **(2001E):** \$824 billion

Merchandise Imports (2000E): \$1,223 billion **(2001E):** \$1,250 billion

Merchandise Trade Balance (2000E): -\$450 billion **(2001E):** -\$426 billion

Major Exports (1999): Capital goods excluding automobiles (\$312 billion), industrial supplies (\$142 billion), consumer goods excluding autos (\$81 billion), motor vehicles and parts (\$76 billion), services (\$291 billion)

Major Imports (1999): Capital goods excluding autos (\$297 billion), consumer goods excluding autos (\$240 billion), motor vehicles and parts (\$179 billion), industrial supplies excluding oil (\$149 billion), petroleum and products (\$68 billion), services (\$196 billion)

Major Trading Partners: Canada, Japan, European Union, Mexico

ENERGY OVERVIEW

Secretary of Energy: Spencer Abraham (as of January 20, 2001)

Proven Oil Reserves (1/1/01E): 21.8 billion barrels

Oil Production (2001E): 8.1 million barrels per day (bbl/d), of which 5.8 million bbl/d is crude oil (NOTE: Including "refinery gain", US oil production in 2001 is estimated at 9.0 million bbl/d)

Oil Consumption (2001E): 19.7 million bbl/d

Net Oil Imports (2001E): 10.6 million bbl/d

Crude Oil Imports from the Persian Gulf (January-July 2001E): 2.6 million bbl/d (around 28% of total U.S. crude oil imports)

Value of Oil Imports (2000E): \$119.3 billion (up from \$67.2 billion in 1999)

Crude Oil Refining Capacity (2001E): 16.7 million bbl/d (91% utilization rate as of 10/12/01)

Oil Stocks (8/01E): 1.55 billion barrels (including about 545 million barrels in the U.S. Strategic Petroleum Reserve)

Oil Wells Drilled (January-August 2001E): 3,634 (up from 3,000 in January-August 2000)

Operating Oil and Natural Gas Rotary Rigs (10/01E): 1,141 (933 for natural gas and 208 for oil)

Natural Gas Reserves (1/1/01E): 167 trillion cubic feet (Tcf)

Dry Natural Gas Production (2001E): 19.1 Tcf

Natural Gas Consumption (2001E): 22.7 Tcf

Net Natural Gas Imports (2001E): 3.5 Tcf (over 90% from Canada)

Natural Gas Wells Drilled (January-August 2001E): 13,758 (up from 9,307 in January-August 2000)

Recoverable Coal Reserves (12/31/98): 275.1 billion short tons (54% lignite and subbituminous; 46% anthracite and bituminous)

Coal Production (2000E): 1,076 million short tons (Mmst)

Coal Consumption (2000E): 1,082 Mmst

Net Coal Exports (2000E): 46 Mmst

Value of Coal Exports (1999E): \$2.5 billion

Coal Stocks (12/00E): 142.7 Mmst

Electric Utility Generation Capacity (1/1/99E): 687 gigawatts (coal 44%, natural gas 18%, hydroelectric and other renewables 16%, nuclear 14%, and petroleum 9%)

Electric Net Generation by Utilities (2000E): 3,015 billion kilowatthours (of which coal-fired 56%, nuclear 23%, natural gas 10%, hydroelectricity 8%, oil 2%, geothermal and "other" 0.1%)

Non-utility Power Production (2000E): 785 billion kilowatthours (of which natural gas-fired 39%, coal 35%, "geothermal and other" 10%, nuclear 6%, oil 5%, hydroelectric 3%, and "other gaseous fuels" 1%)

Total Electricity Demand (2000E): 3,600 billion kilowatthours

ENVIRONMENTAL OVERVIEW

Administrator of the U.S. Environmental Protection Agency: Christie Whitman

Total Energy Consumption (2000E): 98.8 quadrillion Btu (25% of world total energy consumption)

Energy-Related Carbon Emissions (1999E): 1,519 million metric tons of carbon (24.7% of world total carbon emissions)

Per Capita Energy Consumption (1999E): 355.9 million Btu

Per Capita Carbon Emissions (1999E): 5.5 metric tons of carbon

Energy Intensity (1999E): 12,638 Btu/\$1990**

Carbon Intensity (1999E): 0.19 metric tons of carbon/thousand \$1990

Sectoral Share of Energy Consumption (1998E): Industrial (38.2%), Transportation (26.6%), Residential (19.4%), Commercial (15.8%)

Sectoral Share of Carbon Emissions (1998E): Industrial (32.6%), Transportation (32.0%), Residential (19.4%), Commercial (16.0%)

Fuel Share of Energy Consumption (1999E): Oil (39.1%), Natural Gas (23.0%), Coal (22.4%)

Fuel Share of Carbon Emissions (1999E): Oil (42.7%), Coal (36.1%), Natural Gas (21.1%)

Renewable Energy Consumption (1998E): 6,516 trillion Btu (1% decrease from 1997)

Number of People per Motor Vehicle (1998): 1.3

Status in Climate Change Negotiations: Annex I country under the United Nations Framework Convention on Climate Change (ratified October 15th, 1992). Under the negotiated Kyoto Protocol (signed on November 12th, 1998 - not yet ratified), the United States has agreed to reduce greenhouse gases 7% below 1990 levels by the 2008-2012 commitment period.

Major Environmental Issues: Air pollution resulting in acid rain in both the US and Canada; the US is the largest single emitter of carbon dioxide from the burning of fossil fuels; water pollution from runoff of pesticides and fertilizers; very limited natural fresh water resources in much of the western part of the country require careful management; desertification.

Major International Environmental Agreements: A party to Conventions on Air Pollution, Air Pollution-Nitrogen Oxides, Antarctic-Environmental Protocol, Antarctic Treaty, Climate Change, Endangered Species, Environmental Modification, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands and Whaling. Has signed, but not ratified, Air Pollution-Persistent Organic Pollutants, Air Pollution-Volatile Organic Compounds, Biodiversity, Desertification, Hazardous Wastes.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear,

geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

**GDP based on EIA International Energy Annual 1999

ENERGY INDUSTRY

Major U.S. Oil Companies: ExxonMobil, Texaco, Chevron, BP, Shell, USX, Phillips, Conoco

Major U.S. Coal Companies: Peabody Holding Co., Inc.; Cyprus AMAX Minerals Co.; Consol Energy Inc.; Kennecott Energy Co.; Zeigler Coal Holding Co.

Oil Pipelines (2001E): Around 2 million miles **Natural Gas Pipelines** (2000E): 278,000 miles

Major Ports: Baltimore, Chicago, Hampton Roads, Houston, Los Angeles, New Orleans, New York, Philadelphia

Sources for this report include: Associated Press; Christian Science Monitor; Dallas Morning News; Dow Jones; DRI/WEFA; EIU Viewswire; Energy Daily; Financial Times; Financial Times Energy Newsletters; Gas Daily; Houston Chronicle; Los Angeles Times; Megawatt Daily; New York Times; PR Newswire; Reuters; U.S. Energy Information Administration (numerous publications -- see links); Washington Post; World Markets Online 2001).

Links

For more information on U.S. energy, see these other sources on the EIA web site:

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Links to other U.S. government sites:

[2000 CIA World Factbook - U.S.](#)

[U.S. Department of Energy's Office of Fossil Energy Home Page](#)

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